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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/603,684	06/26/2003	Mahmoud H. Abd Elhamid	GP-302186	3780

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EXAMINER

CANTELMO, GREGG

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 11/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/603,684

Applicant(s)

ABD ELHAMID ET AL.

Examiner

Gregg Cantelmo

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 7-22, 25-33 and 48-63 is/are pending in the application.
- 4a) Of the above claim(s) 50-63 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-22, 25-33, 48 and 49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 7/31/06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. In response to the amendment received August 24, 2006:
 - a. Claims 1-4, 7-22, 25-33 and 48-63 are pending;
 - b. The prior art rejections of record are withdrawn in light of the amendment

Election/Restrictions

2. Newly submitted claims 50-63 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: newly recited claims 50-63 are drawn to a materially different composite separator than that in the previously recited claims.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 50-63 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 48 and 49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims recite that the expanded graphite (claim 48) or compressible material (claim 49) is in particle sizes of greater than 10 percent of the final plate thickness.

However this contradicts the base claims to which claims 48 and 49 are respectively dependent.

In the base claims the expanded graphite (claim 1) or compressible material (claim 18) extends from the first surface to the second surface and thus spans the thickness of the separator.

The exact nature of the graphite size is rendered indefinite. If claims 1 and 18 are meant to teach that individual particles themselves extend from the first surface to the second surface and thus spans the thickness of the separator. Then particle sizes of the graphite would be at least 100% of the final plate thickness. Therefore any particle sizes less than 100% would not meet the requirement of claims 1 or 18. If claims 1 and 18 are meant to teach that the sum of the individual particles extend across the separator then claims 48 and 49 would in fact fall in the scope of claims 1 and 18.

The new language of claims 48 and 49 render these claims indefinite for the reasons set forth above.

For the purpose of claim interpretation, claims 1 and 18 have been interpreted to mean that the sum of the individual particles extend from the first surface to the second surface and thus spans the thickness of the separator. As such, then the graphite particles therein could include particle sizes which are greater than 10% and less than 100% of the final plate thickness.

Clarification is respectfully requested.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-4, 7-13, 16-22, 25-29 and 32-33 are rejected under 35 U.S.C. 102(b) as being anticipated by CA 02391894 (CA '894).

CA '894 discloses a composite separator plate for use in a fuel cell stack of the type having a first surface and a second surface opposite said first surface (Fig. 2), the composite separator plate comprising a polymeric material and expanded graphite dispersed in said polymeric material (abstract, page 13, line 23 through line 12 and page 19, line 22 through page 20, line 6), wherein at least some of said expanded graphite extends from said first surface to said second surface. Notably, CA '894 teaches of using preferred flaky branched-needle-like shapes or dendritic shapes since these particles have many contacting points after molding and result in the electrical conductor materials to be in contact to contribute good conductivity (page 19, ll. 3-15). In thus the conductive expanded graphite particles described therein are expectant to provide conductive pathways which extend from the first surface of the separator to the second surface of the separator (as applied to claims 1 and 18). The expanded graphite is inherently compressible, especially the needle-like flakes or dendritic shapes discussed above (as applied to claim 18).

The expanded graphite comprises between about 10% and about 50% by volume, and further about 35% by volume (page 25, ll. 3-10 as applied to claims 2, 3, 19 and 20).

The compressible material comprises expanded graphite (as discussed above and applied to claim 21).

The expanded graphite is in particle sizes of between about 0.1-1mm (page 16, ll. 6-24 as applied to claims 4 and 22).

The polymeric material is selected from the group consisting of thermoset and thermoplastic polymers (page 19, ll. 22-25 as applied to claims 7 and 25).

The polymeric material is selected from the group consisting of: epoxy, polyvinyl ester, polyester, polypropylene, and polyvinylidene fluoride (page 19, ll. 22-35 as applied to claims 8 and 26).

The expanded graphite is inherently compressible, especially the needle-like flakes or dendritic shapes discussed above. Furthermore, the expanded graphite has an inherent degree of compression relative to the amount of force exerted on the sheet. Note that the claims fail to specify any value or range of values for the extent of the compression and thus can be any degree of compression (as applied to claim 9).

In addition, the voids where the resin is present is construed to be equivalent to the pores present in the graphite material (as applied to claim 10). Note that the end product is not porous else it would not effectively function as a separator.

In a further embodiment the separator comprises expanded graphite and a fibrous material in the polymer matrix (page 32, ll. 1-2). The fibrous material is construed to be a filler (as applied to claims 11 and 27).

The fibers are carbon fibers (page 32, ll. 1-13 as applied to claims 12 and 28).

With respect to the properties of claims 13, 16, 17, 29, 32 and 33:

Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

"In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)

In the case of the instant application the basis for expectation of inherency is that since CA '894 teaches of using the same expanded graphite in the same resin and both are used as a conductive sheet, there is a reasonable expectation that composite separators of CA '894 would inherently exhibit the same claimed permeation and specific resistance requirements, absent clear evidence to the contrary (as applied to claims 13, 16, 17, 29, 32 and 33). Furthermore it is evident that the prior art separators

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exhibit the same specific resistance as claimed (see Examples 1, 3-5, 7, 8, 11, 12, 20-24, 33 and 34).

The Examiner requires applicant to provide that that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product.

Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

Response to Arguments

5. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 14, 15, 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over CA '894 in view of either Blunk of record, JP 05-182679 (JP '679) or JP 62-272465 (JP '465).

The teachings of CA '894 have been discussed above and are incorporated herein.

The differences between claims 14-15 and 30-31 and CA '894 does not teach of the conductive layer disposed over the separator (claims 14 and 30) or of the conductive layer material being selected from the group consisting of gold, silver, platinum, carbon, palladium, rhodium and ruthenium.

Blunk discloses a composite bipolar separator where metal films are disposed on the outer surfaces of the separator. The surface is coated with materials including gold, ruthenium, palladium, rhodium and platinum (col. 9, ll. 35-45).

According to JP '679: A fuel cell has an electrolyte film, positive electrode and a negative electrode 20 in both sides of the film, collector 30 in the outside of the electrode 20 and a collector terminal 40 brought into contact with this collector as a single cell. Here, a surface of the collector 3 consisting of porous carbon sintered material or the like is coated with a metal of platinum, gold, iridium, etc., excellent in conductivity and corrosion resistance to about 0.05 to 2 μ m by a sputtering method or the like. In this way, a sum of contact resistances between the collector 30 and the terminal 40 and between the collector and an electrode and resistance of the collector 30 itself is reduced to about 1/2. Since a metal is advanced into an interface of the collector and a catalytic layer, also hydrogen adsorbing power is improved.

JP '465 teaches providing an expanded graphite outer layer to a carbon based separator. Expanded graphite is a particular carbon product (abstract).

The motivation for providing a metal film on the outer surface of the composite separator is to reduce the contact resistance of the components.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of CA '894 by providing a metal film on the outer surface of the composite separator since it would have reduced the contact resistance of the separator.

7. Claims 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over CA '894.

The teachings of CA '894 have been discussed above and are incorporated herein.

The difference between CA '894 and claims 48 and 49 is that CA '894 does not teach of the require relationship between the plate thickness and e-graphite particle size.

CA '894 discloses a variety of particle sizes and plate thicknesses at least some of the combinations held to render the claimed relationship obvious.

For example, CA '894 teaches of the advantages of using needle-like flakes or dendritic shapes for the e-graphite, as discussed above. CA '894 teaches that the average particle size is about 250 microns (page). Furthermore CA '894 teaches that the plate has a thickness for section B which is from 0.25-2mm and preferably 0.25 to 1 mm (page 31, ll. 9-16). The suggested combination above renders particle sizes of 250 microns or 0.25mm which when disposed in portion B of the separator would arrive at the claimed proportion of the particle size of claims 48 and 49 relative to the plate thickness at sections B.

Thus while not expressly teaching of the specific relationship recited in claims 48 and 49, at least some of the combination of dimensions of CA '894 would obviously result in graphite particle sizes which are greater than 10% of the thickness of portions of the separator plate. Generally, differences in ranges will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such ranges is critical. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In re Aller,

220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). It has been held that when the difference between a claimed invention and the prior art is the range or value of a particular variable, then a prima facie rejection is properly established when the difference in the range or value is minor. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

Response to Arguments

8. Applicant's arguments filed August 24, 2006 have been fully considered but they are not persuasive.

Applicant argues that the Blunk '918 is disqualified as prior art under 35 U.S.C. §103(c). The present application has a filing date of June 26, 2003 and was assigned to General Motors Corporation on November 24, 2003 at Reel/Frame 014722/0438. Evidence of such an assignment is attached hereto. Blunk '918 issued on November 2, 2004 and was assigned to General Motors Corporation on January 29, 2002 at Reel/Frame 012549/0986. Evidence of such an assignment is attached hereto. Thus, the present invention and Blunk '918 are commonly owned, and the Blunk '918 patent is disqualified as prior art under 35 U.S.C. §103(c).

No evidence of common ownership was received in Applicants response and thus this rejection stands.

Conclusion

9. Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on July 31, 2006 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS**

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MADE FINAL. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read "Gregg Cantelmo", with a stylized flourish at the end.

gc

November 2, 2006

Gregg Cantelmo
Primary Examiner
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